



Nymphs of Two Peltoperlid Stoneflies (Plecoptera: Peltoperlidae) from Vietnam

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Abstract Two species of peltoperlid stonefly nymphs, *Cryptoperla bisaeta* (Kawai) and *Cryptoperla* sp. 1 (Plecoptera, Peltoperlidae), are described from Vietnam. Their descriptions, diagnoses, photographs, and taxonomic remarks are provided.

Key words *Cryptoperla*, Peltoperlidae, description

INTRODUCTION

The Peltoperlidae is a small group of Plecoptera, comprising over 46 species from the Palearctic Asia, Nearctic, and Oriental Regions (Stark and Stewart, 1981; Sivec and Yang, 2001). Nymphs of the family are distinctively roach-like in appearance by possessing shield-like thoracic tergites, and their thoracic sternites possess posterior fringes or intercalary setal rows (Stark and Stewart, 1981; Stark, 1989). Male adults of Peltoperlidae are characterized by the 9th abdominal sternite that possesses a button-like ventral lobe on the frontal margin of well-developed subgenital plate and by the modified basal cercal segment; female adults are characterized by the hind margin of the 8th abdominal sternite that strongly produced into a large subgenital plate (Kawai, 1967). The nymphs are herbivore-detritivores, and occur primarily in springs and headwaters of high mountain streams, commonly inhabiting in leaf packs.

Stark (1989) reviewed 17 species (three genera) of Oriental Peltoperlinae, six of which are known in nymphal stage. In Vietnam, the peltoperlid fauna have been studied by Kawai (1969), Stark (1989), and Stark and Sivec (1999) with reports of *Cryptoperla bisaeta* (Kawai), *C. karen* Stark, and *Peltoperlopsis malickyi* Stark and Sivec, but no nymphal stoneflies have been known from the country.

In the course of a taxonomic study of Vietnamese Plecoptera, we recognized two species of peltoperlid nymphs as described below. Materials were collected from Vietnam in 2001 and 2002 and deposited in Seoul Women's University Aquatic Insect Collection (SWU-AIC). All materials are preserved in 80% ethyl alcohol.

TAXONOMIC ACCOUNTS

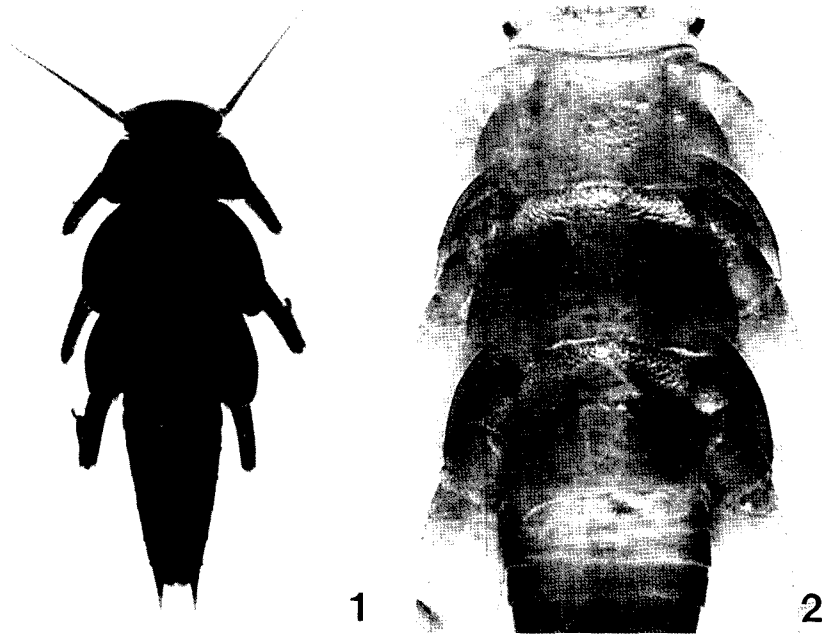
Cryptoperla bisaeta (Kawai)

(Figs. 1-2)

Peltoperlodes bisaeta Kawai, 1968. Oriental Insect 2: 109.

Cryptoperla bisaeta (Kawai): Stark, 1989. Ent. Scand. 19: 504.

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Figs. 1–2. *Cryptoperla bisaeta*, nymph. 1: dorsal nymph. 2: thoracic sternites.

Nymph. Body length 6.8 mm; antennae length 4.7 mm; cerci length 1.5 mm. General body flattened, roach-like form, dark yellowish brown, without markings. *Head.* Head small (head width 1.7 mm), short, nearly two thirds as wide as posterior margin of pronotum, without markings, with epicranial suture distinct. Compound eyes large, black, located dorsally on lateral margin of head. Ocelli small, two; distance between ocelli nearly as far as distance from ocellus to inner margin of compound eye. Antennae strong and attenuating, yellowish brown, nearly $2/3$ x length of body. *Thorax.* Thoracic tergites (Fig. 1) dark yellowish brown, without markings, greatly extended laterally, covered with brown bristles. Pronotum large, marginally brown; anterior margin narrower than posterior margin; lateral margin rounded; posterior margin with row of bristles. Mesonotum larger than pronotum, narrower than metanotum; posterior margin with row of brown bristles. Metanotum very large, extended backwards. Mesothorax and metathorax with pair of single white finger-like gills on posterior supracoxal regions; prothorax, cervical, and subanal regions without gills. Thoracic sternites large and yellowish brown, extended laterally and posteriorly; anterior margin of prosternite, posterior corners of prosternite and mesosternite, and anterior corners of all sternites fringed with row of brown stout bristles (Fig. 2). Legs relatively short and strong, yellowish brown, covered with brown hairs and bristles. *Abdomen.* Abdomen relatively short, tapering; ventrally somewhat flattened; segment 1–5 yellowish brown, without fringe of bristles on posterior margin; segment 6–10 brown, with fringe of brown stout bristles on posterior margin; tergite 10 triangular, extending backwards; subanal lobe relatively small, round, and fringed with two rows of brown stout bristles on posterior margin. Cerci short, tapering distally; each joint with short and stout bristles on posterior margin.

Adult. Previously known from Thailand (see Kawai, 1968; Stark, 1989).

Materials examined. 54 nymphs, Dak Lak Prov., Dak Pri' Cr. (alt. 450, 480, 630, 700, 740, 770, 800, 970 m), 4/13 III 2001, DH Hoang; 27 nymphs, Son Tay Prov., Khoang Xanh, 22 II 2002, TKT Cao.

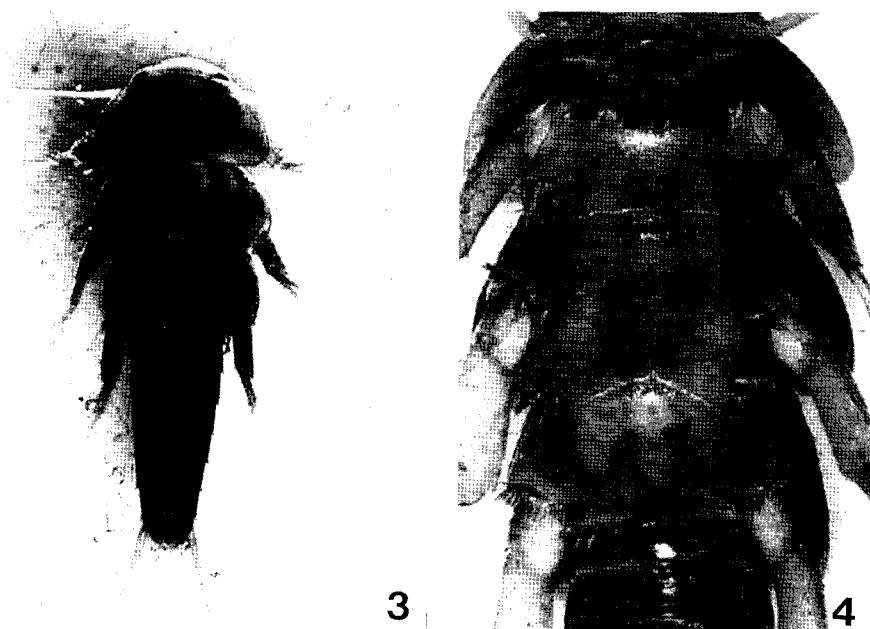
Diagnosis. The nymph of *Cryptoperla bisaeta* can be distinguished from other known species of the genus by the combination of the following characters: body roach-like form without markings (Fig. 1); thoracic sternites with one row of bristles (Fig. 2); subanal lobe posteriorly not produced into tapered gills; and cerci short and stout.

Distribution. Thailand, Vietnam.

Remarks. This species was originally described by Kawai (1968) based on adult and nymphal specimens from Thailand. Kawai (1969) reported female adult of this species from southern Vietnam.

***Cryptoperla* sp. 1**
(Figs. 3-4)

Nymph. Body length 7.1 mm; antennae length 3.5 mm; cerci length 4.0 mm. General body flattened and brown, with light brown and dark brown markings. *Head.* Head small (head width 1.7 mm), narrower than posterior margin of pronotum, with light brown V-shaped markings located near frontal margin; epicranial suture distinct. Compound eyes large, black, and located dorsally on lateral margin. Ocelli two and small. Antennae brown, ca. 1/2 x length of body. *Thorax.* Thoracic tergites yellowish brown, greatly extended laterally, with brown bristles. Pronotum large, with symmetrical irregular dark brown markings (Fig. 3); anterior margin narrower than posterior margin. Mesonotum slightly larger than pronotum and metanotum; mesonotum and metanotum with light and dark markings (Fig. 3). Supracoxal regions of mesothorax and metathorax with pair of single, white, finger-like gills posteriorly; proth-



Figs. 3-4. *Cryptoperla* sp. 1, nymph. 3: dorsal nymph. 4: thoracic sternites.

orax and cervical regions without gills. Thoracic sternites large, yellowish brown, extended laterally and posteriorly; anterior margin of prosternite plate, lateral margins of mesosternite and metasternite plates, and posterior margin of metasternite plate fringed with row of brown stout setae (Fig. 4); posterolateral margins of prosternite and mesosternite plates fringed with three rows of stout setae (Fig. 4). Legs relatively short and strong, yellowish brown, covered with brown hairs. *Abdomen*. Abdomen relatively short, with dark brown narrow band on posterior margin; tergite segment 1–6 brown, with incomplete fringe of bristles on posterior margin; tergite segment 3–5 with distinct triangular light marking on median line (Fig. 3); segment 6–10 brown, with complete fringe of brown stout bristles on posterior margin; tergite 10 triangular, extending backwards; subanal lobe relatively small, round, fringed with two rows of brown stout setae; apices of subanal lobe elongated to slender gills. Cerci relatively long, tapering distally; each joint with long and stout setae on posterior margin.

Adult. Unknown.

Materials examined. 19 nymphs, Dak Lak Prov., Dak Pri' Cr. (alt. 630, 700, 970 m), 6/9 III 2001 DH Hoang.

Diagnosis. The nymph of this species is distinguished from other known species of the genus by possessing three rows of setae near posterior angles of prosternal and mesosternal plates (Fig. 4) and distinct body markings (Fig. 3).

Distribution. Vietnam.

Remarks. We informally describe this species because most Oriental peltoperlids are known in adult stage only.

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